REPORT NO. 75-2-3 JULY 1974

5230

EVALUATION OF THE SOUTHERN PINE BEETLE INFESTATIONS ON THE BANKHEAD NATIONAL FOREST, ALABAMA

by

I. R. Ragenovich, L. M. Moore,
J. F. Denniston, and E. N. Boddie

INTRODUCTION

An aerial sketch map survey and subsequent ground examinations were conducted on the Bankhead National Forest during the last of June and first of July 1974 (Figure 1). The survey, which covered the Bankhead (180,683 acres) and Black Warrior (168,232 acres) Districts, and was performed by the Forest Pest Management Group to determine the current status and trend of the southern pine beetle populations on this unit.

The southern pine beetle infestations on this Forest are part of a southwide outbreak involving 10 states. The current outbreak was first observed on this Forest in the summer of 1972.

METHODS

A 50 percent aerial sketch map survey[1/] was performed in evaluating the southern pine beetle population.

A portion of the spots detected during the aerial phase of the evaluation were examined on the ground to confirm the cause of mortality, the percent of spots that were active, and to assess the general condition of beetle populations.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

1/ Detection of forest pests in the Southeast, 1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF-7, Atlanta, Ga., 51 pp.

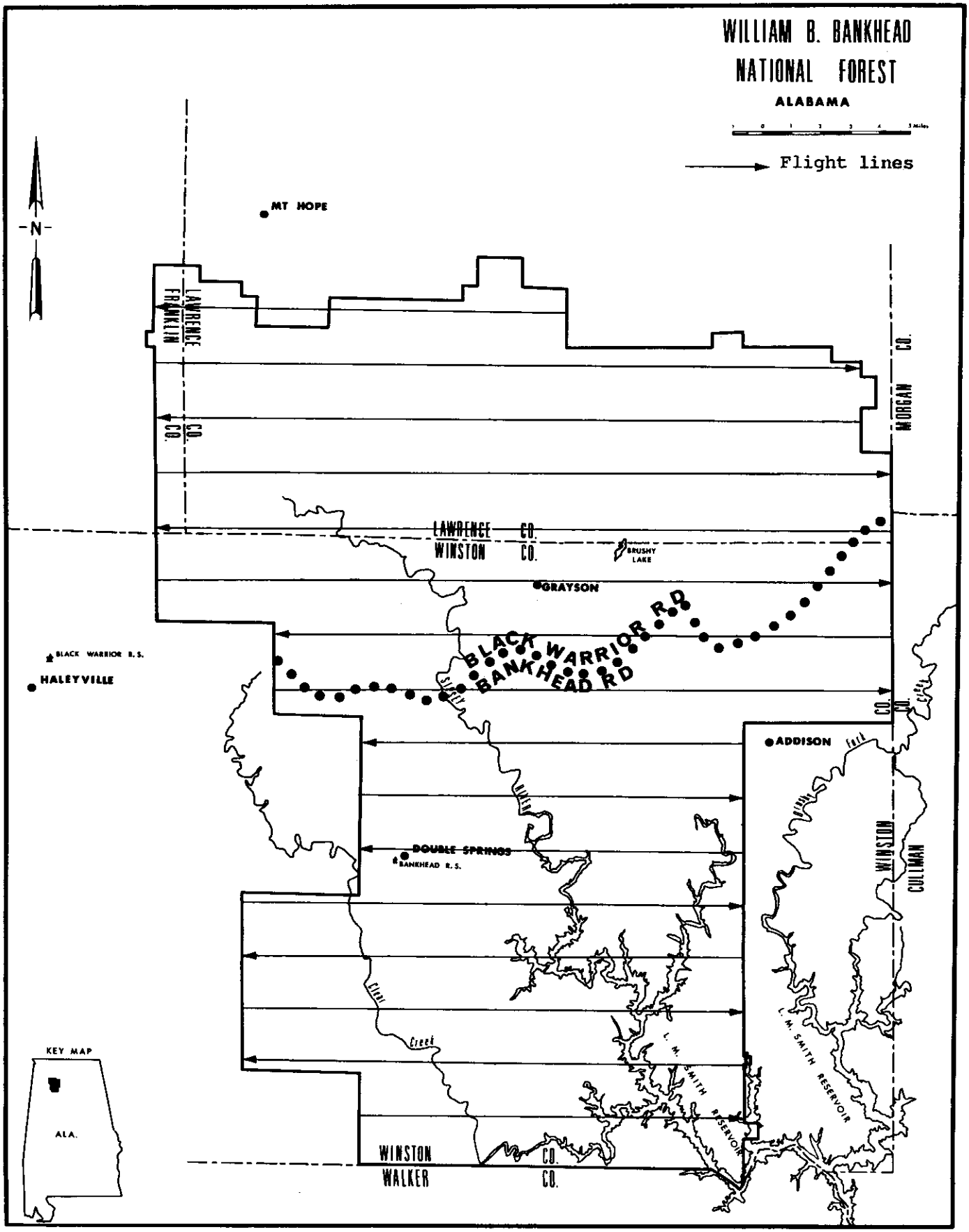

Figure 1. Map showing flight lines for sketch map survey on the Bankhead National Forest, Alabama, 1974.

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces the blue stain fungi, *Ceratocystis* spp., which slows down or blocks conduction of water in the stem.

Life cycle of the beetle - The beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as seven generations may be produced in a year. The Forest experienced an unseasonable wet May and dry June. In April a tornado cut through the Forest in a north-south direction.

RESULTS AND DISCUSSION

The southern pine beetle population is presently at low levels on the Bankhead National Forest. There is approximately one infested tree per M acres host type on the Bankhead District and three infested trees per M acres on the Black Warrior District.

The Black Warrior District contained more spots per thousand acres host type and a higher number of infested trees per thousand acres host type. However, the Bankhead District had a higher ratio of green infested to red and fading infested trees, and 46 percent more spots were infested than on the Black Warrior District. There is a decrease in the total number of spots on the Forest when compared to previous years' reports (Figure 2a and 2b).

Results of the evaluation are summarized in Tables 1 and 2.

Bankhead National Forest

Bankhead District -

Eighty percent of the spots examined in ground survey are currently infested with southern pine beetle. There was a green infested to red and fading infested tree ratio of 1:1. Brood density is 425 insects per square foot of bark surface. Although number of spots is down, these data indicate that infestation levels could increase in late summer and fall.

Black Warrior District -

Of the spots checked in ground surveys, 33 percent were infested. There was a green infested to red and fading infested tree ratio of 0.22:1 and a brood density of 490 insects per square foot of bark surface. These data indicate that population levels could be expected to increase during late summer and fall on the District.

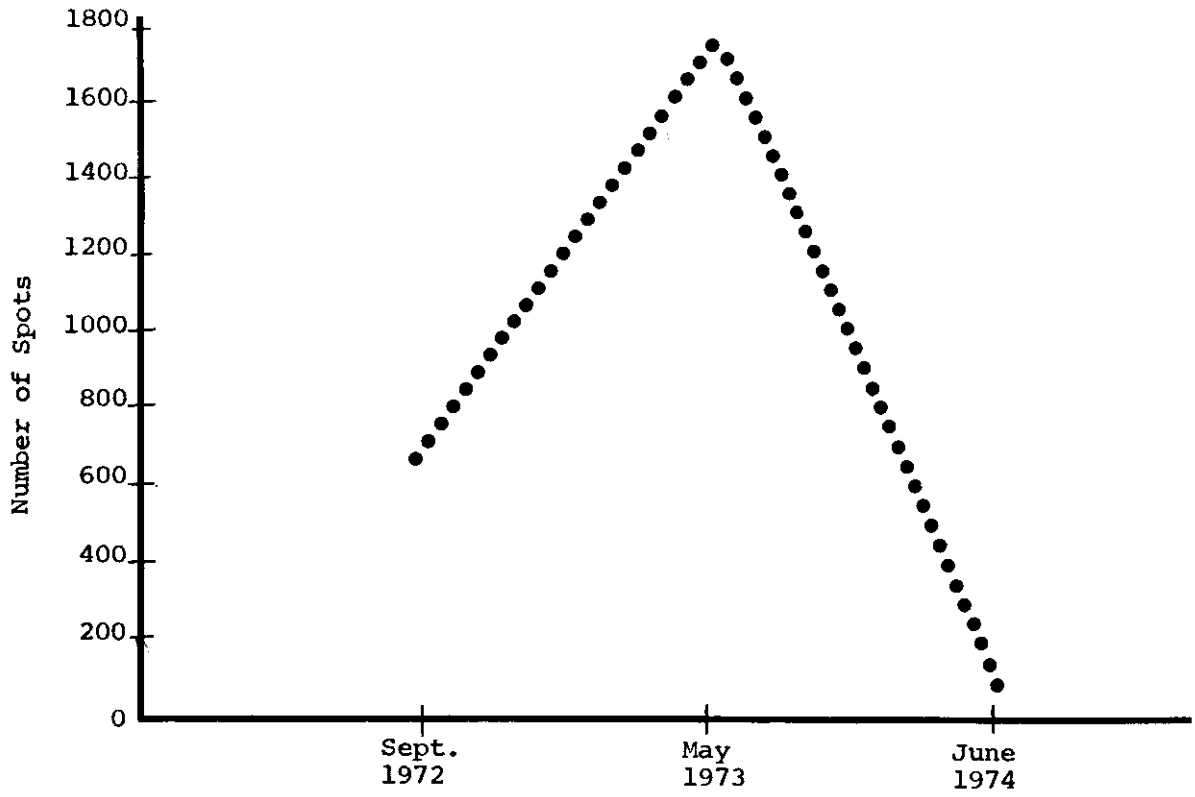

Figure 2a.--Illustrationof trends of southern pine beetle spots for the past two years on the Bankhead District, Bankhead National Forest, Alabama.

Figure 2b.--Illustration of trends of southern pine beetle spots for the past two years on the Black Warrior District, Bankhead National Forest, Alabama.

Table 1. Summary of the results of a Southern Pine Beetle Evaluation conducted on the Bankhead and Black Warrior Districts, Bankhead National Forest, Alabama, June 1974

	Ownership	
	Bankhead R. D.	Black Warrior R. D.
Results compiled from data collected during the aerial phase of the evaluation		
Survey type	50 percent sketch map	50 percent sketch map
Date of aerial survey	June 26, 1974	June 27, 1974
Total acreage surveyed	180,683	168,232
Total acres of susceptible host type	112,023	104,304
Total number of spots within the survey boundary	111	195
Spots per M acres host type	0.99	1.87
Average spot size (trees)	1.36	2.72
Range of spot size (trees)	1-6	1-12
Reds and faders per M acres host type	1.2	5.5
Results compiled from data collected during the ground and aerial phases of the evaluation		
Date of ground phase	July 7, 1974	July 1, 1974
Infested trees per M acres host type	1.02	2.7
Total number of infested trees within survey boundary	114	277
Total number of affected[1/] trees	232	645
Ratio of green infested to red and fading infested trees	1:1	0.22:1
Brood density - insects per square foot	425	490
Total volume of affected trees (CCF)	4.76	0.65
Total volume of affected trees (MBF)	1.5	23.2
Total volume of infested trees (CCF)	3.2	0.75
Total volume of infested trees (MBF)	0.56	6.5
Percent of spots infested	80 percent	33 percent

[1/] Affected means all dead and/or infested trees.

Table 2. Summary of the aerial survey data - Southern Pine Beetle Evaluation on the Bankhead and Black Warrior Districts, Bankhead National Forest, Alabama, June 1974[1/]

Ownership	Spot Size--Trees						Avg. Mult. Tree Spot Size[2/]
		2-5	6-20	21-50	51+	Total	
	Singles	Spots:trees	Spots:trees	Spots:trees	Spots:trees	Spots:trees	
Bankhead Ranger District	98	10:23	3:18	0:0	0:0	111:139	3.15
Black Warrior Ranger District	98	71:213	26:260	0:0	0:0	195:571	4.8
Total All Districts	196	81:236	29:278	0:0	0:0	306:710	

1/ Corrected according to Aldrich, et al., 1958; expanded to 100 percent survey.

2/ Single trees not included.

RECOMMENDATIONS

It is recommended that both the Bankhead and Black Warrior Districts continue southern pine beetle suppression measures in accordance with the Southern Pine Beetle Control Plan for the National Forests in Alabama and FSM 5250. Project funds for Fiscal Year 1975 should be continued.

Service trips and training sessions will be conducted on the districts during the fall of 1974.

REFERENCES

Aldrich, R. C., R. C. Heller and W. F. Bailey. 1958. Observation limits for aerial sketchmapping southern pine beetle damage in the southern Appalachians. J. of For. 56(3):200-202.

Rush, P. A. 1972. Evaluation of southern pine beetle infestations on the Bankhead National Forest, Alabama. USDA For. Serv., SA, S&PF, Forest Pest Mgmt. Group, Rept. No. 73-2-6.

Wilmore, D. H., W. A. Nettles and D. R. Kucera. 1973. Evaluation of southern pine beetle infestations on the Bankhead National Forest, Alabama. USDA For. Serv., SA, S&PF, Forest Pest Mgmt. Group, Rept. No. 73-2-20.